

CHAPTER 1 – PURPOSE AND NEED

Chapter 1 – Purpose and Need is organized as follows:

- **1.1 Project Location and Background** – Introduces the project and provides general information relating to the project location, area growth, traffic, project limits, and purpose of the environmental study.
- **1.2 Corridor Planning** – Discusses State Street planning efforts.
- **1.3 Need for the Proposed Action** – Identifies project need including system linkage, regional growth, and capacity and travel demand.
- **1.4 Purpose of the Proposed Action** – Identifies the project purpose including accommodating regional travel demand, providing a transportation facility consistent with current standards, providing a transportation facility consistent with local, regional, and state plans, enhancing opportunities to incorporate multi-modal facilities within the corridor, and improving the continuity of State Street.
- **1.5 Related Environmental Impact Statements, Environmental Assessments, and Other Relevant Documents and Planning Studies** – Identifies other local and regional planning documents and related studies.

1.1 PROJECT LOCATION AND BACKGROUND

The Federal Highway Administration (FHWA) and the Utah Department of Transportation (UDOT), in conjunction with the City of Pleasant Grove, propose to make transportation improvements to State Street (US-89) between 200 South and Geneva Road (SR-114) in Pleasant Grove, Utah County, Utah (see Figure 1-1), a distance of approximately 0.56 miles. As described in Section 1.3, the purpose of this project is to make roadway improvements to State Street in order to more safely and efficiently accommodate existing and future traffic volumes and travel demands along the State Street corridor.

Utah County has experienced rapid growth over the last several decades, and is expected to continue this growth into the foreseeable future. Utah County had a population of 368,536 in 2000 (U.S. Census) and is expected to exceed a population of 615,000 by 2020 (Governor's Office of Planning and Budget), an increase of 67%. A complete summary of the population growth in Utah County is provided in Table 1-1 in Section 1.3 Need for the Proposed Action. In addition to the expected population growth, both local and regional travel demand are expected to increase as well.

State Street Railroad Bridge in Pleasant Grove, STP-0089(76)300E
Environmental Assessment

State Street functions as one of three primary north-south roadways in Utah County [the others being I-15 and Geneva Road (SR-114)] and connects the cities of Springville, Provo, Orem, Lindon, Pleasant Grove, American Fork, and Lehi. In addition, State Street provides these cities with access to many east-west collector roads and I-15. From Provo to Lindon, State Street is composed of a seven-lane typical section (three travel lanes in each direction) and from Lindon to Lehi State Street is composed of a five-lane typical section (two travel lanes in each direction) except for a two-lane section under the Utah Transit Authority's (UTA)/Union Pacific Railroad's (UPRR) railroad bridge. Between 200 South and Geneva Road in Pleasant Grove, State Street is a two-lane typical section (one travel lane in each direction) and is the only two-lane section of State Street in Utah County, creating a narrow bottleneck which results in extreme traffic congestion, excessive delays, and long lines during peak travel periods. This document addresses the transportation needs and proposed improvements for this section of State Street.



The termini for this study are 200 South and Geneva Road in Pleasant Grove. These termini coincide with the five-lane sections of State Street to the north and south of the project (see Figure 1-2). The project has independent utility since improving this two-lane section of State Street would be a usable and reasonable expenditure even if no additional transportation improvements are made to State Street.

This Environmental Assessment (EA) has been prepared to assist local, state, and federal decision makers in identifying the best course of action to improve the geometric deficiencies and traffic operations of State Street between 200 South and Geneva Road in Pleasant Grove, Utah County, Utah. Specifically, the objective of the National Environmental Policy Act (NEPA) and this EA is to evaluate proposed courses of action and make decisions in the best overall public interest, based upon a balanced consideration of the need for safe and efficient transportation; the social, economic, and environmental impacts of proposed improvements; and the national, state, and local environmental protection goals. This document has been prepared in accordance with NEPA and the document content conforms to the Council on Environmental Quality (CEQ) and FHWA regulations.

A Federal agency may publish a notice in the Federal Register, pursuant to 23 USC §239(1), indicating that one or more Federal agencies have taken final action on permits, licenses, or approvals for a transportation project. If such notice is published, claims seeking judicial review of those Federal agency actions will be barred unless such claims are filed within 180 days after the date of publication of the notice, or within such shorter time period as is specified in the Federal laws pursuant to which judicial review of the Federal agency action is allowed. If no notice is published, then the periods of time that otherwise are provided by the Federal laws governing such claims will apply.



Figure 1-2. Study Termini.

1.2 CORRIDOR PLANNING

Planning for the proposed action began as part of the Mountainland Association of Governments' (MAG) regional planning efforts for Utah, Summit, and Wasatch Counties. Working cooperatively with UDOT, UTA, and local agencies, MAG has conducted regional transportation planning and has developed and maintained a Long Range Transportation Plan (LRTP) for Utah County since 1971. This plan is consistent with federal law and is based on a comprehensive, area-wide transportation systems analysis that addresses all modes of transportation, including highways, transit, trucking, rail, air, pedestrian, and bicycle. Of these modes of transportation, this document addresses highway, transit, pedestrian, and bicycle.

1.2.1 Short Range Planning

Mountainland Association of Governments Short Range Planning

MAG is the designated Metropolitan Planning Organization (MPO) for the Provo/Orem Urbanized Area (including all municipalities in Utah County) and is responsible for the Transportation Improvement Program (TIP). The latest 2005 Utah Valley TIP identifies projects for highway improvements, bicycle routes, and transit facilities that have sufficient need to be implemented within the 2005-2009 short range planning period. To coincide with anticipated financing and revenue streams, the projects identified in the 2005 TIP update have been divided

into four separate funding sources: Under and Unfunded Projects; Utah Valley MPO Projects; UDOT Projects; and Joint or Local Projects.

- The need for the replacement of the existing UTA/UPRR bridge in Pleasant Grove is identified on this segment of State Street by 2007 (see Figure 1-3) [Utah Valley TIP Figure: UDOT Projects]. The TIP proposes widening State Street, from 200 South to Geneva Road in Pleasant Grove, to five lanes. Funding for these improvements has been secured.

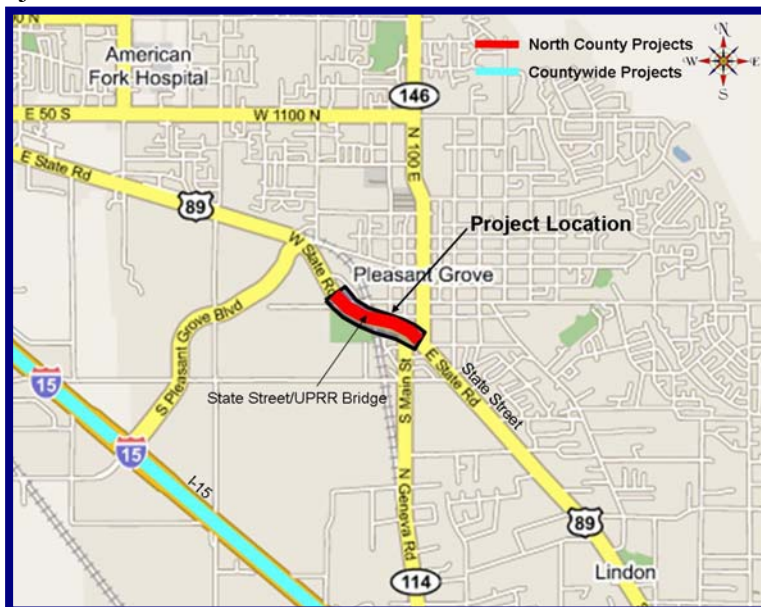


Figure 1-3. 2005 Utah Valley MPO TIP – UDOT Projects.

- The need for immediate State Street corridor improvements, from 100 East in American Fork to 200 South in Lindon, is identified (see Figure 1-4) [Utah Valley TIP Figure: Under and Unfunded Projects]. The TIP indicates the need for widening State Street to seven lanes. No funding for this project has been secured (project is proposed under long range future plans).

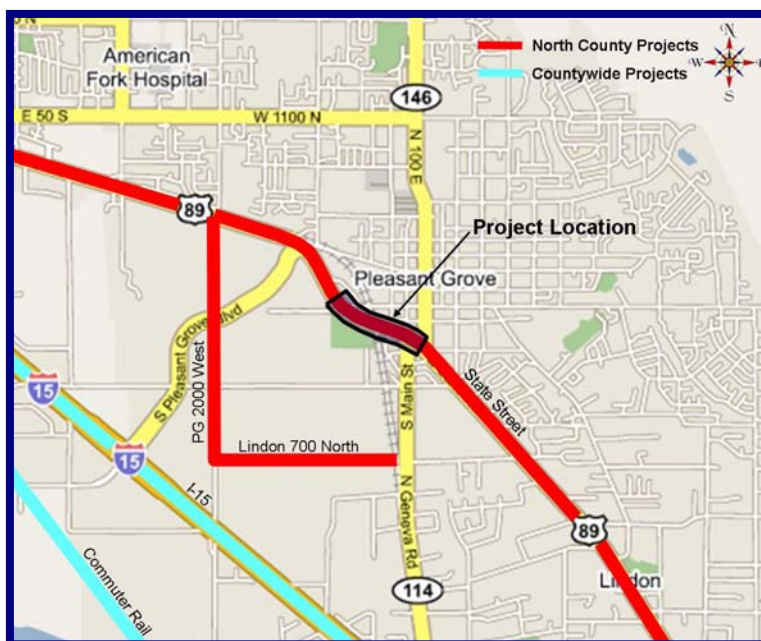


Figure 1-4. 2005 Utah Valley MPO TIP – Under and Unfunded Projects.

Utah Department of Transportation Short Range Planning

State Street is part of the United States Highway system, designated as United States Route 89. UDOT has recognized the role of State Street in the regional transportation system and the need to make improvements to this corridor by including State Street, between 200 South and Geneva Road in Pleasant Grove, on the Statewide Transportation Improvement Program (STIP). The STIP is a five-year plan of highway and transit projects for the State of Utah that guides the development of projects through conception, environmental studies, right-of-way acquisition,

planning, and advertising for construction. The STIP has programmed right-of-way and construction activities for this portion of State Street to begin as early as 2007.

Pleasant Grove Short Range Planning

The Pleasant Grove Transportation Master Plan (adopted in 2001) identifies State Street as an arterial roadway serving as the major transportation facility through the city. Designated as a priority project, the Transportation Master Plan recommends immediate upgrades to State Street from 200 South to Geneva Road to improve operations and upgrade this section to five lanes, consistent with State Street segments to the north and south.

1.2.2 Long Range Planning

Mountainland Association of Governments Long Range Planning

The 2005 Utah Valley 2030 LRTP includes planning for highway improvements, bicycle routes, and transit facilities. To coincide with the anticipated financing and revenue streams, the projects identified in the 2030 LRTP have been divided into three separate phases: Phase 1 (2005-2014); Phase 2 (2015-2024); and Phase 3 (2025-2030). The following State Street needs are identified in the LRTP.

- The need for improvements to State Street between Lindon and Pleasant Grove is identified by 2014 (see Figure 1-5) [Utah Valley 2030 LRTP Figure: Freeways and Highways Projects]. The LRTP classifies State Street as a Principal Arterial (see Figure 1-6) [Utah Valley 2030 LRTP Figure: Roadway Functional Classification] and identifies improvements to six travel lanes and a center median lane to increase vehicular capacity.
- State Street is identified in the LRTP as the fourth most congested Principal Arterial and as part of important upgrades needed in northern Utah County.

MAG Defines a Principal Arterial Roadway as a roadway that provides mobility but still maintains access to many bordering activities.

Mountainland Association of Governments Congestion Management System

MAG's Congestion Management System (CMS) is a tool to support development of the LRTP and WFRC's TIP. The CMS implements demand management and system management strategies with the intent to resolve congestion without increasing roadway capacity, if possible. The CMS also recognizes that these management strategies are not sufficient to meet the transportation demand on State Street. This project is a high priority project listed in MAG's CMS (see December 19, 2005 letter in Chapter 4).

Pleasant Grove Long Range Planning

Local transportation planning within Pleasant Grove identifies the State Street corridor as a Principal Arterial facility having local and regional importance. The Pleasant Grove Transportation Master Plan identifies long range (Year 2030), future improvements to State Street, from 100 East in American Fork to 200 South in Lindon, to seven lanes.

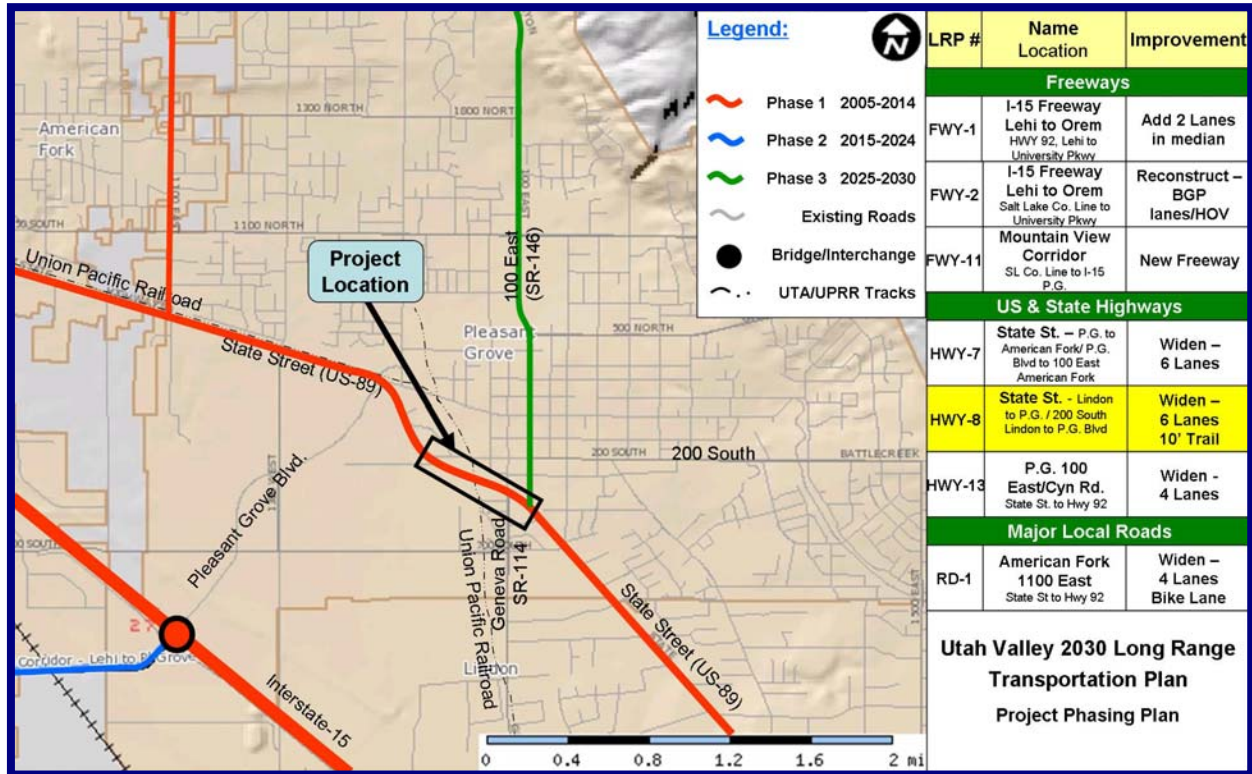


Figure 1-5. Utah Valley 2030 LRTP Freeways and Highways Phasing Plan.

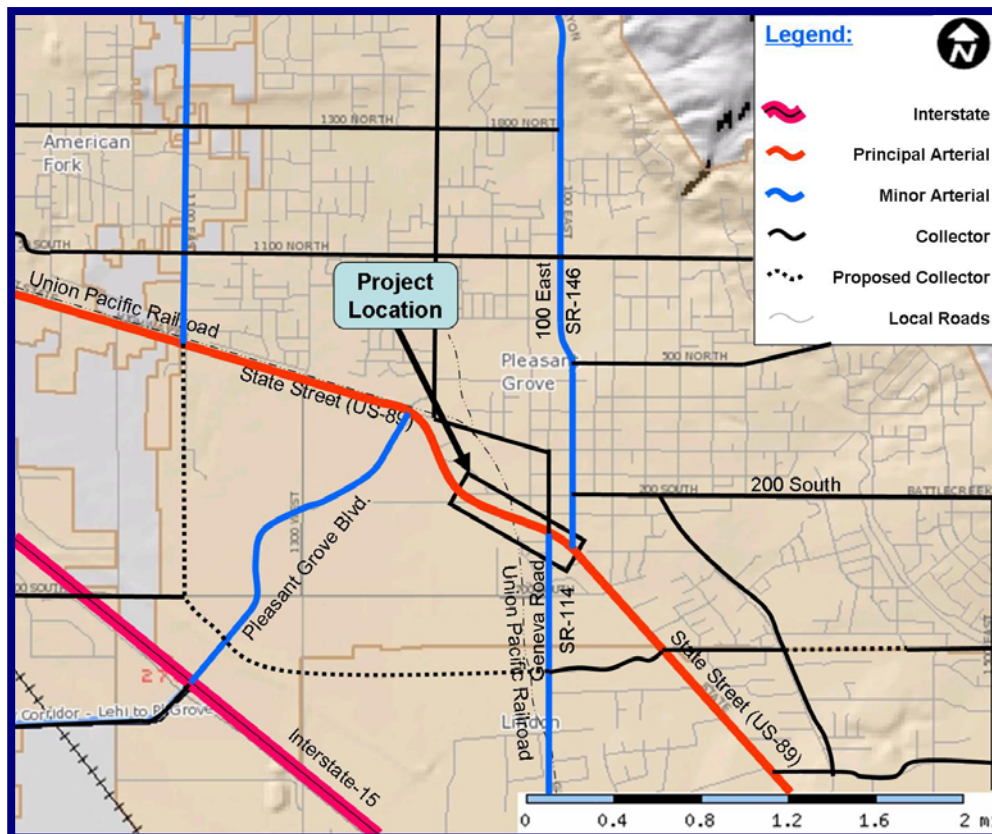


Figure 1-6. MAG Roadways Functional Classification.

Pedestrian/Bike Trails

Current planning efforts by MAG and Pleasant Grove include future development of pedestrian/bike trails throughout Utah County and Pleasant Grove, as shown in Figure 1-7. There are currently no planned trails for State Street; however, current alignments for the proposed pedestrian/bike trails within the project area have a State Street – 200 South crossing and a State Street – Geneva Road crossing. In addition, it is proposed to include a shared pedestrian/bicycle trail along the UTA/UPRR alignment, north of State Street.

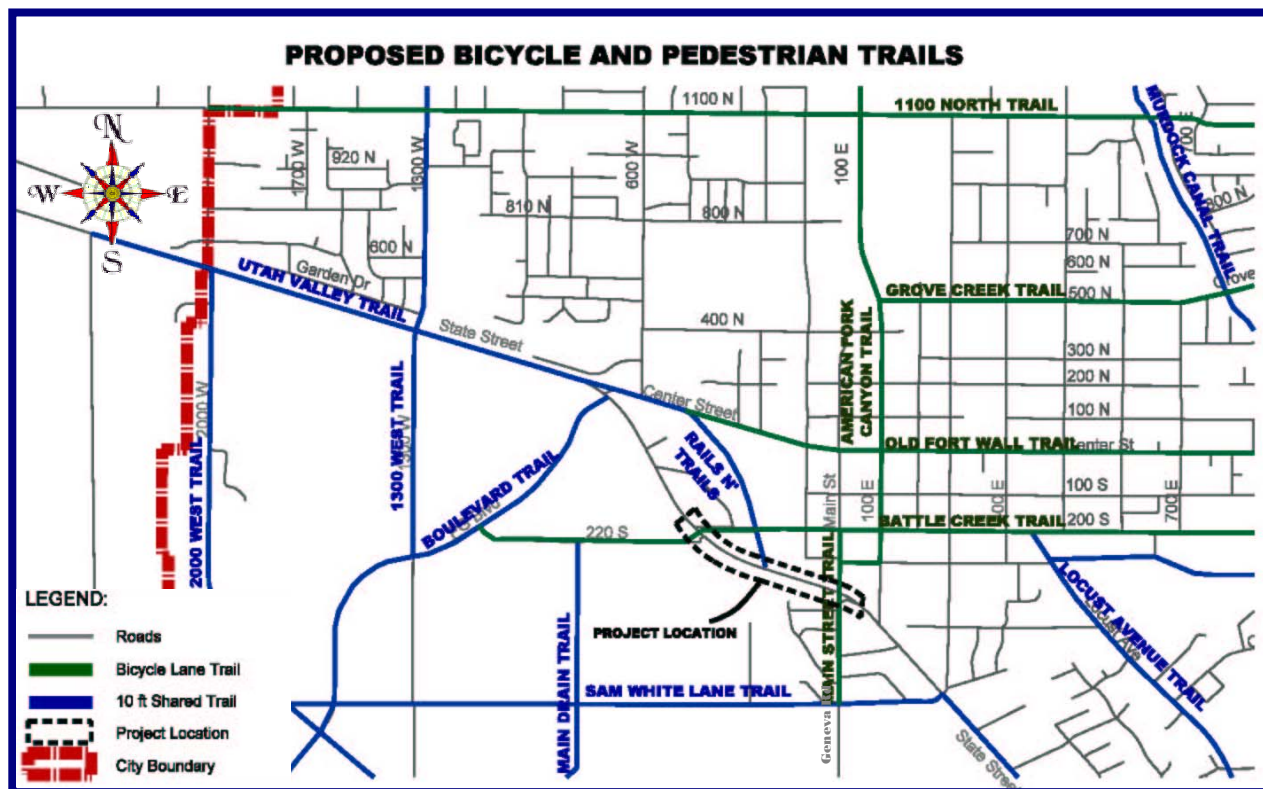


Figure 1-7. Planned Trails (source: Utah Valley 2030 LRTP and Nov. 25, 2003 Pleasant Grove City Trails Plan).

Railway Corridor

The UTA/UPRR railway that crosses State Street in the project area is a secondary freight route that continues to provide service to Union Pacific operations. In September 2002, UTA purchased this rail corridor and is proposing future transit uses on this alignment, including light rail. Any proposed State Street corridor improvements cannot preclude the possibility of future rail uses.

1.2.3 Design Year

As indicated in the short range plans, the immediate bridge replacement and roadway improvements are intended to improve traffic operations and eliminate deficiencies along State Street by upgrading the two-lane bottleneck section under the UTA/UPRR bridge between 200 South and Geneva Road in Pleasant Grove to five lanes. As indicated in the long range plans, major reconstruction of the State Street corridor to seven lanes between 100 East in American Fork and 200 South in Lindon is planned as early as 2014. In order to address the proposed short

term roadway improvements and still account for the long range plans, the design Year 2020 was adopted for the purposes of this study, with the exception of structures and retaining walls. Because structures and retaining walls have significantly extended design lives, these elements of the proposed improvements will be designed to accommodate the 2030 long range plan. These long range plans require structures and retaining walls to provide for the accommodation of a seven-lane roadway on State Street.

1.3 NEED FOR THE PROPOSED ACTION

1.3.1 Regional Traffic Mobility and Circulation

State Street is a Principal Arterial that connects much of Utah County including the cities of Springville, Provo, Orem, Lindon, Pleasant Grove, American Fork, and Lehi. As one of the three principal north-south travel routes in Utah County, State Street serves as an important regional facility by providing access to the connecting communities, many east-west arterial and collector roadways, and I-15 (see Figure 1-1). As these communities continue to grow, as shown in Table 1-1, travel demand on State Street is expected to increase as well.

Table 1-1. Utah Valley Communities' Growth Summary.

| City | 2000 Census Population | 2005 Population Estimates | 2020 Population Projection | 2000-2020 Population Growth |
|-------------------|------------------------|---------------------------|----------------------------|-----------------------------|
| Lehi | 19,028 | 22,106 | 44,437 | 134% |
| American Fork | 21,941 | 25,491 | 27,787 | 27% |
| Lindon | 8,363 | 9,716 | 11,918 | 43% |
| Pleasant Grove | 23,468 | 27,265 | 30,415 | 30% |
| Orem | 84,324 | 97,966 | 100,020 | 19% |
| Provo | 105,166 | 122,179 | 130,814 | 24% |
| Springville | 20,424 | 23,728 | 34,132 | 67% |
| Utah County Total | 368,536 | 428,156 | 615,480 | 67% |

Source: US Census Data, Governor's Office of Planning and Budget's Population Projections for Utah's Cities & Unincorporated Areas: 2000-2030

1.3.2 Capacity, Travel Demand, and Intersection Operations

The *Highway Capacity Manual* defines the capacity of a roadway facility as the maximum rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of lane or roadway during a specified time period under given roadway, geometric, traffic, environmental, and control conditions; usually expressed as vehicles per hour or passenger cars per hour. In analyzing the capacity of a given facility, the concepts of volume over capacity ratio (V/C) and Level of Service (LOS) are used.

V/C ratios characterize the traffic operations of a facility in terms of such factors as maximum service flows, traffic densities, speeds, geometric configurations, terrain, and access point density. Volume over capacity values correlate to the amount of traffic on a given roadway, as shown in Table 1-2, and can be used to describe the level of congestion experienced with a given volume of traffic. Traffic volumes correlating to V/C values are based on the Annual Average

Daily Traffic (AADT) which is measured in vehicles per day (vpd). More specifically, V/C can be used to describe the various stages of congestion, as displayed in Figure 1-8, where a V/C greater than one represents the worst operating conditions (extreme congestion and delay). UDOT has identified a V/C of 0.85 for arterial roadways in urban areas as the planning goal in the Transportation 2030, UDOT's Long Range Transportation Plan.

Table 1-2. Relationship Between Capacity, Level of Congestion, and V/C Ratios for Urban Highways.

| | | Capacity - Suburban Highway (40 mph – 45 mph) | | | | | | V/C |
|--------------------------|----------|--|----------------|-----------------|-----------------|-----------------|-----------------|-----------|
| | | 2-Lane | 3-Lane | 4-Lane | 5-Lane | 6-Lane | 7-Lane | |
| Congestion | Low | < 8,600 | < 9,460 | < 17,200 | < 19,350 | < 22,790 | < 24,940 | < 0.43 |
| | Moderate | 8,600 - 16,400 | 9,460 – 18,040 | 17,200 – 32,800 | 19,350 – 36,900 | 22,790 – 43,460 | 24,940 – 47,460 | 0.43-0.82 |
| | High | 16,400 > | 18,040 > | 32,800 > | 36,900 > | 43,460 > | 46,400 > | 0.82 > |
| Acceptable Volume | | 17,000 | 18,700 | 34,000 | 38,250 | 45,050 | 49,300 | 0.85* |
| Estimated Capacity (vpd) | | 20,000 | 22,000 | 40,000 | 45,000 | 53,000 | 58,000 | 1.0 |

* UDOT (in Transportation 2030, UDOT's LRTP) has determined a V/C of 0.85 as the planning goal for arterial roadways in urbanized areas.

Source: *Highway Capacity Manual*, Special Report 209

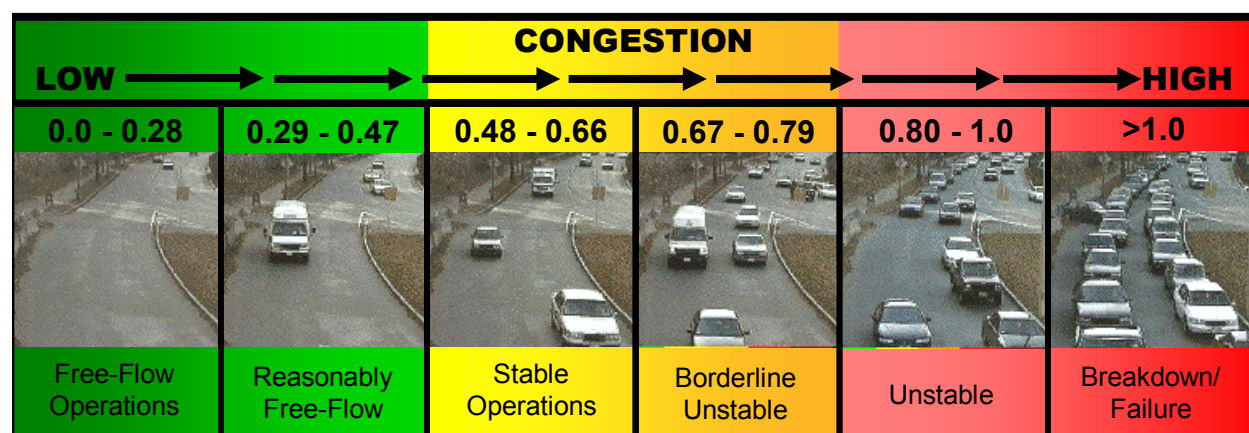


Figure 1-8. Relationship between Level of Congestion, V/C, and Traffic Conditions.

For roadway segments controlled by signalized intersections, the concept of LOS can be used to define expected travel delay and level of congestion at the intersection approach during peak travel periods. Table 1-3 shows the associative intersection approach delay for each LOS category as well as the level of congestion. For planning purposes, LOS C is generally acceptable for rural areas and LOS D is acceptable for urbanized areas. In some cases, LOS E may be acceptable, due to constraints such as cost, right-of-way limitations, feasibility, environmental impacts, central business districts, etc.

Table 1-3. Relationship between Intersection Level of Service, Approach Delay, and Level of Congestion.

| LOS | Delay (sec) | Level of Congestion |
|--------|----------------|------------------------|
| A B | <10 10-20 | LOW |
| C D | 20-35 35-55 | MODERATE |
| E F | 55-80 80> | HIGH SEVERE |

For the purposes of this study, V/C is utilized to describe the existing and projected operating conditions of State Street from 200 South to Geneva Road, while intersection LOS is used to describe the operating conditions of the State Street and Geneva Road signalized intersection. From 200 South to Geneva Road, State Street is defined as an un-signalized, two-lane, suburban arterial roadway. As defined in Table 1-2, the capacity of this facility at a V/C of 0.85 is 17,000 vpd.

Drivers on State Street, from 200 South to Geneva Road are experiencing increasing congestion as traffic volumes have exceeded the capacity of the two-lane roadway. As shown in Figure 1-9, the 2004 daily traffic volumes for State Street are 32,400 vpd (north of 200 South), 24,500 vpd (200 South to Geneva Road), and 31,300 vpd (south of 100 East). Referring to Table 1-2, the acceptable volume of a two-lane suburban highway is approximately 17,000 vpd with a V/C of 0.85.



Based on measured 2004 traffic volumes, State Street, from 200 South to Geneva Road, operates with 24,500 vpd and a V/C of 1.22 compared with the two-lane capacity of the roadway at 20,000 vpd (see Table 1-2). This value indicates extreme levels of congestion during peak travel periods. Table 1-4 summarizes the 2004 and projected 2020 traffic volumes and V/C for the existing two-lane State Street.

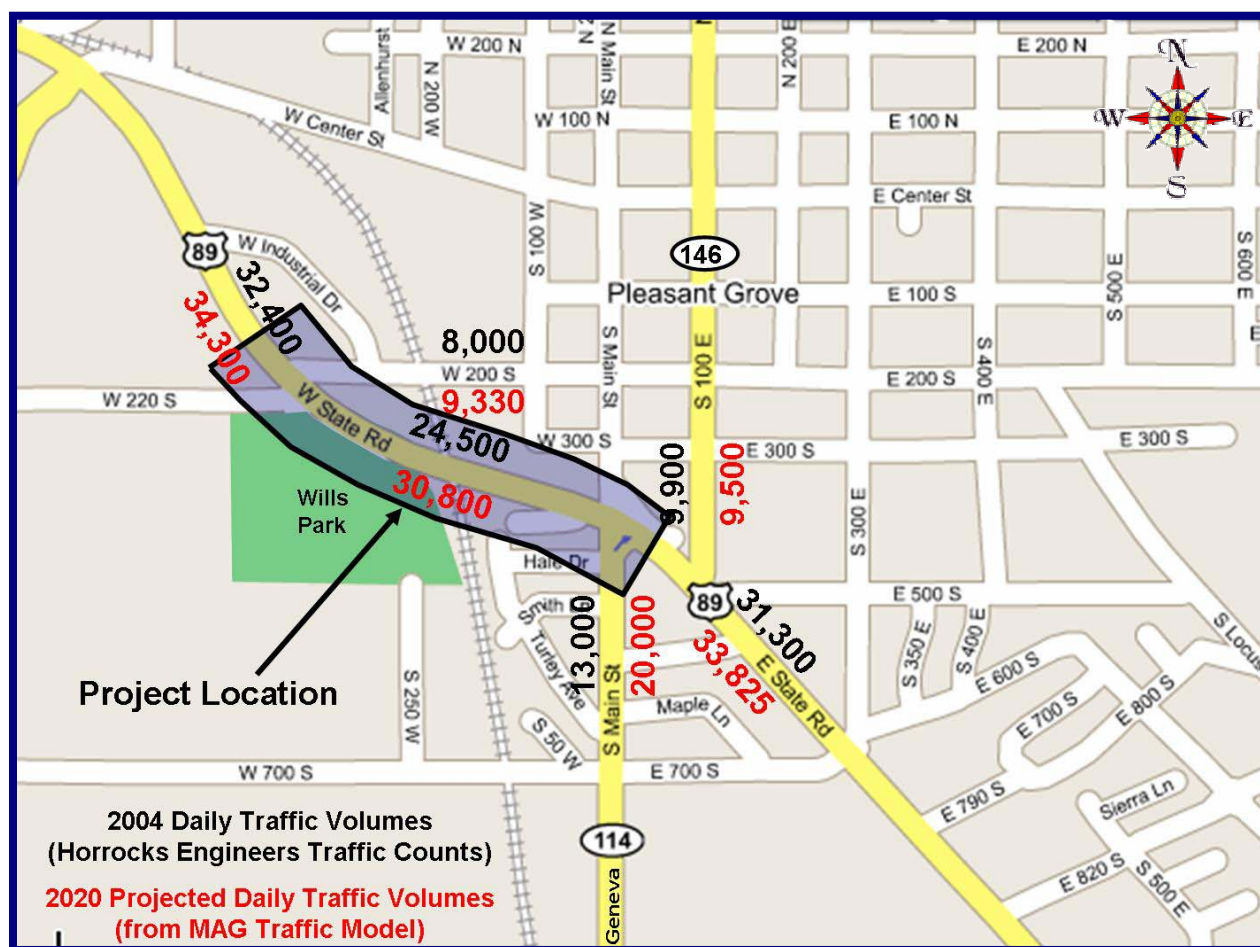


Figure 1-9. Existing and Projected Travel Demand For Roadways within Study Limits.

The projected Year 2020 traffic volumes for State Street are expected to be 25.7% higher than Year 2004 traffic volumes. Year 2020 traffic volumes assume that all projects on the LRTP (including a seven lane State Street) are constructed that are within the Year 2020 timeframe.

Table 1-4. 2004 and Projected Year 2020 Traffic Volumes, V/C Ratio, and Level of Congestion.

| Year | State Street (US-89) - 200 South to Geneva Road Pleasant Grove | | |
|------|--|---|--|
| | Traffic Volumes (vpd) | V/C Ratio (Unimproved State Street) | Level of Congestion (Unimproved State Street) |
| 2004 | 24,500 | 1.22 | HIGH/CAPACITY EXCEEDED |
| 2020 | 30,800 | 1.54 | HIGH/CAPACITY EXCEEDED |

The State Street-Geneva Road intersection is the only signalized intersection within the project limits. Based on Year 2004 and projected Year 2020 travel demand, the PM peak intersection delay values and LOS in Table 1-5 were calculated. From these analyses, it was determined that State Street and Geneva Road currently operate under high levels of congestion with a LOS E. Projected Year 2020 conditions without roadway/intersection improvements are expected to have severe congestion with the intersection operating at LOS F.

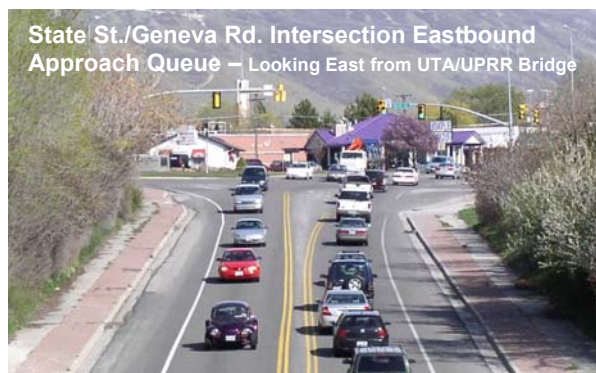


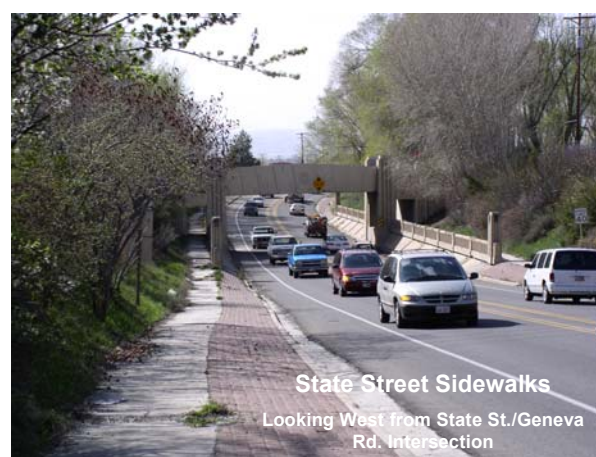
Table 1-5. PM Peak Intersection Operations Summary – State Street and Geneva Road.

| Year | Direction | Delay (sec) | LOS | Average | |
|---------------------------|------------|-------------|-----|-------------|-----|
| | | | | Delay (sec) | LOS |
| 2004 | Eastbound | >100 | F | 59.1 | E |
| | Westbound | 22.0 | C | | |
| | Northbound | 60.0 | E | | |
| | Southbound | 31.5 | C | | |
| 2020 (No Improvements) | Eastbound | >100 | F | >100 | F |
| | Westbound | 54.5 | D | | |
| | Northbound | 93.0 | F | | |
| | Southbound | >100 | F | | |

1.3.3 Roadway Design Deficiencies

Pedestrian Facilities

The existing longitudinal grade of sidewalks along State Street exceed the maximum desirable gradients established by the Americans with Disabilities Act (ADA) of 1990. The existing longitudinal grade heading west from the intersection of State Street and Geneva Road is -5.28% for a horizontal distance of 530 feet. The ADA standards establish a maximum horizontal distance of 40-ft for grades between +/-5.0% and +/-6.25%.



UTA/UPRR Bridge

The existing UTA/UPRR bridge does not meet current UDOT design standards for roadway overhead clearances. The minimum overhead clearance established by UDOT is 16-ft 6-in; the existing overhead clearance is 14-ft 4-in. As a result, the existing structure has been hit by trucks on several occasions. In addition to the substandard vertical clearance, the bridge is functionally obsolete since its limiting width restricts State Street to two-lanes (a five-lane typical section is needed to accommodate the current and projected Year 2020 travel demand).

A Structural Sufficiency Rating has not been developed for this structure (structural sufficiency ratings are not developed by UDOT for railroad bridges), but a 2003 structure appraisal indicated that the UTA/UPRR Bridge was structurally sufficient.



State Street UTA/UPRR Bridge – Eastbound Approach

Roadway Drainage

The aging storm drain system for this portion of State Street is no longer capable of adequately accommodating current drainage needs. This deficiency results in the accumulation of water within the roadway during typical storm events. Water accumulation within the roadway can lead to reduced driver visibility and reduced vehicle stopping ability, increasing the potential for accidents and effectively reducing roadway safety.



State Street Catch Basin – South Side of Road, East of UTA/UPRR Bridge

1.3.4 System Continuity

As previously discussed, State Street maintains a five to seven-lane typical section throughout Utah County, with the exception of the 200 South to Geneva Road segment in Pleasant Grove. This segment narrows to two lanes as State Street passes under the UTA/UPRR railroad bridge. Reconstruction of the UTA/UPRR bridge and widening this segment of State Street to five lanes will restore system continuity to the State Street corridor as displayed in Figure 1-2.

1.4 PURPOSE OF THE PROPOSED ACTION

The purpose of the proposed action is to address the identified project needs (see Section 1.3). Specifically, the proposed action is intended to:

- **Accommodate existing and projected travel demand along State Street.** Providing increased capacity to a notable bottleneck area that is located on an important local and regional arterial facility will allow for better accommodation of existing and projected future travel demands by reducing travel delays and congestion, improving State Street's ability to satisfy both the local and regional needs.
- **Provide a transportation facility consistent with current standards, including those adopted by UDOT and the American Association of State Highway and Transportation Officials (AASHTO).** Current design standard deficiencies include:
 - Substandard pedestrian facilities
 - Substandard overhead clearance at the UTA/UPRR overpass structure
 - Inadequate storm drain system
- **Provide a transportation facility consistent with state and regional plans.** These plans include:
 - UDOT has identified the need for State Street improvements as part of the state highway system.
 - MAG, in its Utah Valley 2030 LRTP, has recognized State Street as an important facility to satisfy local and regional travel demands.
- **Enhance opportunities to incorporate intermodal facilities within the corridor.**
 - Provide a roadway section and structure that can better accommodate existing and future rail corridor uses of UTA and UPRR without precluding the possibility of future transit opportunities
 - Provide for future pedestrian and bicycle facilities
- **Improve continuity of State Street (US-89) corridor** by improving the deficient section of State Street with a roadway section that is consistent with the northern and southern segments.

1.5 RELATED ENVIRONMENTAL IMPACT STATEMENTS, ENVIRONMENTAL ASSESSMENTS, AND OTHER RELEVANT DOCUMENTS AND PLANNING STUDIES

The proposed action is independent of other projects under consideration and is consistent with several local and regional planning documents, including:

- *2005 Utah Valley MPO Transportation Improvement Program* (approved by FHWA August 20, 2004).
- *Utah Valley 2030 Long Range Transportation Plan* (approved by FHWA March 2005).
- *UDOT Statewide Transportation Improvement Program 2005-2009*
- Pleasant Grove Transportation Master Plan (Adopted March 2001).
- I-15 Corridor Environmental Impact Statement, Utah County – Salt Lake County (Final EIS expected Summer 2007)
- Geneva Road EIS (Final EIS expected end of 2007)